① A. $10011011_2 = 155$

$456_7 = 237$

$38A_{16} = 10 + 8\times16 + 3\times16^2 = 906$

$2214_5 = 4 + 1\times5 + 2\times5^2 + 2\times5^3 = 309$

B. $69_{10} = 64 + 4 + 1 = 2^6 + 2^2 + 2^0 = 1000101_2$

$485_{10} = 256 + 128 + 64 + 32 + 2\times2 + 1 = 2^8 + 2^7 + 2^6 + 2^5 +$

2^4 [illegible] $+ 1\times2^0 = 111100101$

$6D1A_{16} = 10\times16^0 + 1\times16^1 + 13\times16^2 + 6\times16^3 = (0110110100011010$

C. $1101011_2 = [0110]\times2^4 + [1011]\times2^0$

$= 6\times2^4 + 11\times2^0 = 6\times16^1 + 11\times16^0 = 6B_{16}$

$895_{10} = 3\times16^2 + 7\times16^1 + 15\times16^0 = (37F)_{16}$

② 1. $7566_8 + 4515_8 = 14303_8$

2. $10111001_2 + 111_2 = 11000000_2$

3. $7A66_{16} + 45C5_{16} = C02B_{16}$

4. $3022_5 - 2433_5 = 34_5$

③ $124_{10} = 01111100_2$ $\quad -124_{10} = 10000100_2$

$109_{10} = 01101101_2$ $\quad -79_{10} = 10110111_2$

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B. 1. $00011110 = 16+8+4+2 = 30$

2. $11100110 = -(00011110) = -(2^4+2^3+2^2+2^1) = -30$

3. $00110110 = 2^5+2^3+2^2+2^0 = 32+8+4+1 = 45$

4. $10011110 = -(01100110) = -(2^1+2^2+2^5+2^6 = 2+4+32+64) = -102$

④ 1. $r \wedge \neg q$ 2. $p \wedge q \wedge r$ 3. $r \rightarrow p$

4. $p \wedge \neg q \wedge r$ 5. $p \wedge q \rightarrow r$ 6. $r \leftrightarrow p \vee q$

⑤ $p \rightarrow q$ implies p is sufficient for q

$p \rightarrow r$ implies p is also sufficient for r

Both propositions, when taken together, imply p is sufficient for both q and r, which is equivalent to $p \rightarrow (q \wedge r)$

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